

WHAT IS CLAIMED IS:

1 1. A router having plunge-type operability for driving a router bit and
2 controlling the depth of cut of a router bit relative to a work piece, said router being
3 useable in an upright and in an inverted position, comprising:

4 a housing assembly having a drive motor being capable of driving a drive
5 shaft to which the router bit can be attached;

6 a base having a generally planar outer surface and a central opening
7 through which the router bit can extend, and at least a pair of posts operatively connected
8 to said housing assembly;

9 a depth adjusting mechanism for controlling the depth of cut of the router
10 bit relative to a baseline position, said adjusting mechanism having a plunge depth rod
11 longitudinally adjustably connected to said housing assembly and a stop surface
12 associated with said base for limiting the depth of cut of the router bit during operation;

13 a sensor for generating position signals indicative of the position of said
14 adjustable depth rod;

15 input means responsive to operator manipulation for generating input
16 signals for controlling the operation of the router;

17 a display responsive to information signals for providing a visual display of
18 information relating to the operation of the router;

19 processing means for receiving said position and input signals and for
20 selectively generating said information and position control signals.

1 2. A router as defined in claim 1 wherein said processing means is
2 adapted to store data defining said baseline position for the router bit responsive to
3 operator manipulation of said input means, said baseline position including a zero
4 position of the router bit when it initially engages the work piece.

1 3. A router as defined in claim 1 wherein said depth adjusting
2 mechanism includes a depth adjusting motor that is responsive to position control signals

3 for adjusting the position of said plunge depth rod relative to said base and thereby
4 adjusting the depth of cut of the router bit.

1 4. A router as defined in claim 3 wherein said processing means
2 receives said position signals and said input signals and responsively generates said
3 position control signals for controlling the depth of cut of the router bit relative to said
4 zero position.

1 5. A router as defined in claim 1 wherein said depth adjusting
2 mechanism includes an engageable lock for selectively locking said plunge depth rod
3 relative to said housing assembly, whereby said depth adjusting motor is capable of
4 moving the plunge depth rod relative to the housing assembly when said lock is
5 disengaged and is capable of moving the housing assembly relative to said base when the
6 lock is engaged.

1 6. A router as defined in claim 1 wherein said input means generates
2 input signals for incrementing or decrementing the depth of cut responsive to operator
3 manipulation thereof.

1 7. A router as defined in claim 6 wherein said input means comprises
2 switch means for selectively incrementing or decrementing the depth of cut responsive to
3 operator manipulation thereof.

1 8. A router as defined in claim 1 wherein said display receives said
2 information signals from said processing means and visibly displays the depth of cut in
3 English or metric increments.

1 9. A router as defined in claim 1 wherein said display comprises a
2 plurality of multiple segment characters, with each character being capable of displaying
3 alpha-numeric characters.

1 10. A router as defined in claim 9 wherein said display includes a
2 display module that includes said plurality of characters aligned in a generally
3 predetermined orientation.

1 11. A router as defined in claim 10 wherein said orientation is
2 perpendicular to the longitudinal direction of the drive motor drive shaft and is capable of
3 being inverted generally 180 degrees.

1 12. A router as defined in claim 6 wherein said input means generates
2 input signals for increasing or decreasing the speed of said drive motor and said display
3 displays the speed of operation of said drive motor.

1 13. A router as defined in claim 10 wherein said display module is
2 capable of being physically reoriented at an inverted orientation.

1 14. A router as defined in claim 10 wherein said display module
2 includes two sets of said plurality of characters, one set being inverted generally 180
3 degrees relative to the other.

1 15. A router as defined in claim 9 wherein said display is one of a liquid
2 crystal display or a light emitting diode display.

1 16. A router as defined in claim 3 wherein said depth adjusting motor is
2 operatively connected to a pinion gear that engages a rack portion of said plunge depth
3 rod, the rotation of said pinion gear in first and second directions causing said plunge
4 depth rod to move relative to said housing assembly in first and second directions
5 generally parallel to said drive motor shaft.

1 17. A router as defined in claim 3 wherein said depth adjusting motor is
2 operatively connected said plunge depth rod which comprises an elongated screw that
3 engages an internal thread in said plunge depth rod, said depth rod being prevented from
4 rotation by said housing assembly, the rotation of said screw in first and second
5 directions causing said plunge depth rod to move relative to said housing assembly in
6 first and second directions generally parallel to said drive motor shaft.

1 18. A router as defined in claim 17 wherein the outer end of said
2 elongated screw has a transverse portion capable of engaging a locking member of said
3 base whereby said depth adjusting motor is capable of moving the plunge depth rod

4 relative to the housing assembly when said locking member is disengaged and is capable
5 of moving the housing assembly relative to said base when said locking member is
6 engaged.

1 19. A router as defined in claim 18 wherein said transverse portion is an
2 annular flange formed by removing an annular portion of the screw near the outer end of
3 the screw and said locking member is moveable relative to said base and has a keyhole
4 shaped opening therein, a larger portion thereof being sized to permit penetration of the
5 end of the screw therein and a smaller portion thereof being sized to engage said
6 transverse portion and retain the screw when said locking member is moved into
7 engagement.

1 20. A router as defined in claim 1 wherein said sensor comprises a
2 digital caliper operatively connected to said plunge depth rod, said potentiometer being
3 capable of producing an electrical signal that is indicative of the specific position of the
4 plunge depth rod relative to the housing assembly.

1 21. A router as defined in claim 1 wherein said sensor comprises a
2 rotary sensing device operatively associated with said depth adjusting motor, said device
3 generating rotary position signals and applying the same to said processing means.

1 22. A router as defined in claim 9 wherein said display has at least six
2 aligned characters, with a forward slash segment separating each pair of characters, said
3 display being capable of displaying fractions of inches responsive to said processing
4 means determining said fractions and generating display information and applying the
5 same to said display.

1 23. A router as defined in claim 1 wherein said processing means
2 includes memory means for selectively storing data indicative of said control signals and
3 information relating to the operation of the router.

1 24. A method of specifying and controlling the depth of cut in a work
2 piece by a plunge router of the type which has a housing assembly containing a drive

3 motor having a drive shaft to which a router bit can be attached, a base having a generally
4 planar outer surface and a central opening through which the router bit can extend, and at
5 least a pair of posts operatively connected to said housing assembly, a depth adjusting
6 mechanism for controlling the depth of cut of the router bit relative to a baseline position,
7 the adjusting mechanism having a plunge depth rod that is longitudinally adjustable and
8 lockable to the housing assembly and a stop surface associated with said base for limiting
9 the depth of cut of the router bit during operation, a sensor for generating position signals
10 indicative of the position of the adjustable depth rod, a display responsive to information
11 signals for providing a visual display of information relating to the operation of the
12 router, and a processing means for receiving said position and input signals and for
13 selectively generating said information and position control signals, comprising the steps
14 of:

15 adjusting the depth adjusting mechanism to bring the router bit into contact
16 with the surface of the work piece;

17 adjusting the plunge depth rod to contact the stop surface;

18 locking the plunge depth rod in place;

19 manipulating the input means to set a zero baseline position;

20 unlocking the plunge depth rod;

21 adjusting the adjusting mechanism to the desired depth of cut by observing
22 the depth of cut values being displayed by the display; and,

23 locking the plunge depth rod in place.

1 25. A method of specifying and controlling the depth of cut in a work
2 piece by a plunge router of the type which has a housing assembly containing a drive
3 motor having a drive shaft to which a router bit can be attached, a base having a generally
4 planar outer surface and a central opening through which the router bit can extend, and at
5 least a pair of posts operatively connected to said housing assembly, a motorized depth
6 adjusting mechanism for controlling the depth of cut of the router bit relative to a

7 baseline position, the adjusting mechanism having a plunge depth rod that is
8 longitudinally adjustable relative to the housing assembly and a stop surface associated
9 with said base for limiting the depth of cut of the router bit during operation, a sensor for
10 generating position signals indicative of the position of the adjustable depth rod, a display
11 responsive to information signals for providing a visual display of information relating to
12 the operation of the router, and a processing means for receiving said position and input
13 signals and for selectively generating said information and position control signals,
14 comprising the steps of:

15 adjusting the depth adjusting mechanism to bring the router bit into contact
16 with the surface of the work piece;

17 adjusting the plunge depth rod to contact the stop surface;

18 manipulating the input means to set a zero baseline position; and

19 adjusting the adjusting mechanism to the desired depth of cut by observing
20 the depth of cut values being displayed by the display.

1 26. A plunge router for driving a router bit, said router being useable in
2 an upright and in an inverted position, comprising:

3 a housing assembly having a drive motor being capable of driving a drive
4 shaft to which the router bit can be attached;

5 a base having a central opening through which the router bit can extend,
6 and being operatively connected to said housing assembly;

7 a depth adjusting mechanism for controlling the depth of cut of the router
8 bit relative to a baseline position;

9 input means responsive to operator manipulation for generating input
10 signals for controlling the operation of the router;

11 a display responsive to information signals for providing a visual display of
12 information relating to the operation of the router, wherein said display comprises a
13 plurality of multiple segment alpha-numeric characters aligned in a generally

14 predetermined orientation, said display being capable of being reoriented at an inverted
15 orientation; and,

16 processing means for receiving said input signals and for selectively
17 generating said information signals.

1 27. A router as defined in claim 26 wherein said predetermined
2 orientation is parallel to the longitudinal direction of the drive motor drive shaft.

1 28. A router as defined in claim 27 wherein said predetermined
2 orientation is perpendicular to the longitudinal direction of the drive motor drive shaft.